

WHAT IS CLAIMED IS:

1. A warning apparatus for signaling wear and tear of a timing belt in an engine, the engine mounted with a timing belt for interacting a rotation of a crank shaft with a rotation of a cam shaft, the apparatus comprising:

5 magnetic force generating means each oppositely arranged about a timing belt to generate a mutually opposite polarity of a magnetic force;

voltage inducing means disposed at one lateral surface of said timing belt to induce a voltage in response to the magnetic force generated from said magnetic force generating means;

10 voltage detecting means for detecting the voltage induced by said voltage inducing means;

a controller for outputting a control signal for generating a warning signal when the voltage detected by said voltage detecting means is less than an established level; and

15 a warning generating unit for generating an alarm that a replacement time of a timing belt has arrived in response to the control signal from said controller.

2. The apparatus as defined in claim 1, wherein said voltage inducing means comprises:

20 a pair of first conductors, each distantly disposed on one lateral surface of said timing belt in a longitudinal direction thereof; and

a plurality of second conductors each disposed on one lateral surface of said timing belt in the longitudinal direction thereof, both ends of each second conductor being respectively connected to the pair of said first conductors.

3. The apparatus as defined in claim 2, wherein said voltage detecting means
25 comprises:

a rotating body whose peripheral surface contacts a lateral surface of said timing belt;

a pair of conductor belts disposed at a peripheral surface of said rotating body

to respectively contact said pair of first conductors;

a connecting unit electrically connected to said pair of conductor belts; and

a voltage meter detecting a voltage between said pair of conductor belts via said connecting unit.

5 4. The apparatus as defined in claim 3, wherein said rotating body is an idler mounted on a timing belt system of an engine for forming a contact angle to said timing belt or providing tension.

5. A warning apparatus for signaling wear of a timing belt, comprising:

10 a magnetic field generator arranged adjacent a timing belt;

at least one conductor disposed on a lateral surface of said timing belt and configured to induce a voltage in response to a magnetic field generated by said at least one conductor moving past said magnetic field generator;

15 a voltage detector coupled to said at least one conductor and configured to detect a voltage induced in said conductor by said magnetic field generator; and

a controller coupled to said voltage detector and configured to generate a control signal when the voltage detected by said voltage meter is less than an established level.

20 6. The warning apparatus of claim 5, further comprising an alarm generating unit for generating an alarm that said timing belt should be replaced in response to the control signal from said controller.

25 7. The apparatus as defined in claim 5, wherein said at least one conductor comprises:

a pair of first conductors, each distantly disposed on one lateral surface of said timing belt in a longitudinal direction thereof; and

30 a plurality of second conductors each disposed on one lateral surface of said timing belt in the longitudinal direction thereof, both ends of each second conductor being respectively connected to the pair of said first conductors.

8. The apparatus as defined in claim 5, wherein said voltage detector comprises:
a rotating body whose peripheral surface contacts a lateral surface of said timing belt;

a pair of conductor belts disposed at a peripheral surface of said rotating body
5 to respectively contact said pair of first conductors;

at least one connecting unit electrically connected to said pair of conductor belts; and

a voltage meter configured to detect a voltage between said pair of conductor belts via said at least one connecting unit.

10 9. The apparatus as defined in claim 8, wherein said rotating body is an idler mounted on a timing belt system of an engine for forming a contact angle with said timing belt or for providing tension.